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THE EMPLOYMENT IMPACT OF THE AGE DISCRIMINATION IN EMPLOYMENT ACT*

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The recent history of the American society is one of significant demographic shifts, not the least important of which is the aging of the general population. As of 1982, the median age of the population was 30.6 years. Given current trends, by the year 2020 the median will be 37 years. Further, it is predicted that, between now and the year 2000, the number of individuals in the 65 to 74 age category will increase by 20%. During this same time period the age category of individuals over 80 will increase by approximately 66% (Schultz, 1980). Population aging of this nature poses numerous interesting and rather complex questions for the economist: On what sources of income will older Americans rely for support? How should pension programs be financed and who should receive benefits? How is the Social Security system to be kept from insolvency? What are the retirement incentives (and work disincentives) created by the existence of public and private pension plans? Each of these questions points out an important economic problem facing the growing number of older aged Americans. While these problems of the aged have received, and continue to receive, enormous research effort, perhaps the most significant economic problem of the aged, employment discrimination and the governments attempts to limit it, has gone relatively unnoticed from a research perspective (Schuster & Miller, 1984).

This inattention to the problem of age discrimination in employment has not simply been a matter of the nation being unaware of the plight of the older worker. In 1965 the Department of Labor issued a report on the problem which indicated that, during the sample period, slightly more than one-half of all available jobs were closed to persons over the age of 55 (U.S. Department of Labor, 1965). As an outgrowth of the new awareness of the problem, the Age Discrimination in Employment Act (ADEA) was passed in 1967. The ADEA prohibits employers from considering age as a factor in the hiring, compensation, job assignment, promotion decisions, or discharge practices concerning those workers aged 40 to 65. In 1978 the ADEA was amended to include protection for workers up through age 69.

The 1978 amendment effectively prohibits mandatory retirement before the age of 70 for most private and public sector workers. Further, the administration and enforcement responsibilities for the ADEA were transferred from a special Department of Labor office to the Equal

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$$ER_t = a_0 + a_1 ED_t + a_2 SUP_t + a_3 PCNP_t + a_4 t + a_5 t^2 + a_6 t^3 + a_7 t^4 + q \quad (1)$$

where:

ER: ratio of the employment rates of older workers (45-65) relative to younger workers (25-44).

ED: ratio of mean years of education of older workers to younger workers.

SUP: ratio of number of older persons to younger persons.

PCNP: percentage change in GNP.

t: time, $t=0, 1, \dots, 21$.

D: dummy variable for year of passage of ADEA, $D=0$ for $t=1961$ through 1967 and $D=1$ after 1967.

Dxt: interaction term.

q: disturbance term.

Using readily available published data for the period 1961-1981, Equation 1 may be estimated for three different employment ratios:

- 1) Older Worker Employment Rate/ Younger Employment Rate
- 2) Older Female Employment Rate/ Younger Female Employment Rate
- 3) Older Male Employment Rate/ Younger Male Employment Rate.

In that each rate of older employment is expressed relative to its younger cohort group, it becomes relatively simple to determine the impact of the ADEA on relative employment. It should also be noted that empirically the employment rates are constructed as those working as a proportion of the entire population of that group, not merely as a proportion of those in the labor force. This adjustment is made to take into account labor force withdrawals and non-participation.

Given the specification of Equation 1, the impact of the passage of the ADEA, as discussed above, may be seen in two ways. The first way of capturing the effect of the ADEA concerns the dummy term (D). If the ADEA has been effective, then the employment rates ratio should higher for the years after the passage, at any given point in time. The dummy, taking on the value of unity for the post-1967 period, is designed to capture this effect of the ADEA. Secondly, the interaction term (Dxt) is included to capture any changes in the trend of relative employment after the passage of the act. For example, if the situation of the older worker was such that, before 1967 they were losing ground relative to younger workers, the coefficient on the variable for time (a_5) would be negative. If the passage of the ADEA had a significantly positive effect then the absolute value of the sum of the coefficients of time and the interaction term would be less than the absolute

Employment Opportunity Commission (EEOC). The EEOC, which is also charged with enforcement of Title VII of the 1964 Civil Rights Act, thus became the federal government's central agent in the enforcement of anti-discrimination legislation. These changes appear to have created a greater awareness of the rights held by older workers under the ADEA as demonstrated by the increase in the number of age discrimination suits filed with the courts. Ten times the number of cases were filed under ADEA provisions in 1982 than in 1969 (Mauro, 1983). While previous researchers have tried to analyze the impact of the ADEA by examining the outcome of ADEA suits (Schuster & Miller, 1984), the influence of an effective public policy must go beyond an individual case and have observable impacts on aggregate behavior.

The purpose of this paper is to consider the effectiveness of the ADEA in alleviating employment inequities among older workers. To facilitate the consideration, an econometric model of the employment of the aged relative to the younger population is presented in the following section. Next, the empirical results of the estimation of the model are presented and discussed. Finally, in the last section, conclusions and implications are drawn from the results concerning the effectiveness of the ADEA.

Econometric Method

Consider first the impact of the original unamended ADEA. The act prohibits discriminatory acts, based on age, against individuals between the ages of 40 and 65. To identify the employment effect of the legislation then, one should consider how the employment of this group has varied with respect to some younger cohort, before and after the enactment of the legislation. For example, if it is determined that the ratio of older to younger worker employment rates was two-thirds prior to the enactment of the legislation, a successful legislative effect might be evidenced by an improvement in the ratio to say three-fourths. Consequently, it is important to consider the level of the ratio of employment rates before and after the acts inception. Consideration of the level of this ratio, however, is not sufficient. To be complete, the analysis must also take into account the effect of time on the relative employment situation of the older worker. It might well be the case that the ratio of older to younger worker employment rates is higher after the legislation than before, but for the legislation to be of practical value in the long run it must also be determined that the rate of any decay overtime in the relative position of the older worker to younger workers has been reversed. For example, if the ratio of older to younger employment rates two-thirds prior to the legislation and if the ratio were declining by 1/4 per year then an improvement in the level of the ratio to three-fourths which is not accompanied by a reduction in this annual rate of decline could hardly be viewed as a complete success in that the older worker would still find himself or herself losing ground to younger workers at the same rate as before the legislation. In such a case the effect of the legislation would be one of "buying time". Therefore, it is important to consider both the level of the ratio of older to younger employment rates and the rate of change in this ratio. A truly successful program would be evidenced by both an improvement in the level and rate of change of the ratio of employment rates.

To consider the effectiveness of the ADEA on the relative employment of the older worker, the following multiple regression model may be estimated:

value of the time coefficient alone, $(\beta_5 + \beta_7) < \beta_5$. In simple terms, if the ADEA were successful the fall in the older to younger worker employment ratio that existed prior to the legislation enactment should either be reversed or, at least to some extent, mitigated. If, on the other hand, the coefficient on the interaction term is found to be negative or insignificant, one would have reason to question the effectiveness of the ADEA. Therefore, as discussed above, the legislation is allowed to effect not only the absolute levels of the ratio, but also the rates at which the ratios change. This is critical in that the ADEA may have had an initial effect and then a longer run effect which was quite different. Consequently, the signs and levels of significance of the dummy and interaction terms allow for the comprehensive evaluation of the effectiveness of the ADEA on the employment of older workers.

As with any regression model, the results concerning the variables in question are valid only under the assumption of ceteris paribus. The other variables in the model are included to control for other factors which conceivably could effect the ratio of employment rates. The education variable, (ED), is the ratio of the median years of education of the older group to the younger group of workers. At first glance the sign on this variable would be assumed to be positive though there may be reason to suspect this prediction to be in error. Specifically, it may be that the impact of education on employment declines over time (Freeman, 1977). That is, a four year college degree may have a stronger impact on the employment of a 30 year old than a 60 year old. As one ages, it seems reasonable to suspect that job experience becomes more important than formal education. Given this, the sign on the education variable is predicted to be indeterminate, a priori.

The relative supply variable, (SUP), is included to take account of the relative populations of the age groups. If there exists some degree of job ticketing in that some jobs are thought of as older worker jobs and others are thought of as younger worker jobs and if there is some degree of wage stickiness, then as the ratio of older to younger potential workers increases one would expect the ratio of older to younger employment rates to decline. Therefore, a negative sign is predicted for the relative supply variable.

Finally, the percentage change in gross national product, (GROW), is included to capture changes in the ratio of employment rates brought about by cyclical changes in the economy. While one would expect the rate of employment of both the older and younger groups to be positively related to the business cycle, the sign on this variable is also indeterminate. The sign will be positive (negative) if the older workers employment is more (less) cyclically sensitive than the younger.

It is important to note that the ADEA was amended in 1978. The amendment, as noted earlier, extended the provisions of the act to those workers between the ages of 66 and 69. Consequently, it is also necessary to consider the amended legislation's impact on the relative employment rates of this age group after 1977. The model specified in Equation 1 can easily be modified to analyze the employment effects of the amended ADEA. Beyond redefining the older age group as those aged 66 to 69, only two minor changes are required. First, the dummy variable is changed to reflect the amendment to the ADEA. That is, the dummy will now take on the value of zero for the period 1961 through 1977 and unity thereafter. Thus, the interaction term (DA) changes concurrently with the dummy variable and will now reflect the changes in the employment ratio occurring since the amendment's passage. Second, realizing the significance of liberalized pensions on the job market behavior of this older group of workers aged 66-69, another control variable defined as the average monthly benefit amount of the OASDI program is

included, (SS). The sign of this variable is predicted to be negative indicating that as the average benefit increases one should find the employment rates of older workers declining relative to younger workers.

The econometric method is therefore designed to determine the effectiveness of ADEA and its 1978 amendment. The results of the estimations are given below.

Empirical Results

Table 1 reports the results for the unamended model of ADEA. In each case the estimation procedure utilized the Cochran-Orcutt technique to control for autocorrelation. The results indicate that the model fits well, in each case offering a high degree of explanatory power. As for specific results, consider first the estimated coefficients of the control variables. In each case R² is negative (significant in the total and male cases). This result indicates that the employment of the older worker (45-65) is in general less sensitive to swings in economic activity than the employment of the younger worker. While this is a benefit to older workers when the economy is moving downward, it poses a significant drag on the relative position of the older worker during economic upturns. The result concerning the relative supply of older workers is surprising. In each case the coefficient on the variable SUP is positive (significant in the total and female cases). Consequently, the greater is the population of older individuals relative to younger individuals, the better the older groups fares in the labor market. Finally, the result concerning education confirms the suspicion discussed above, that is, the impact of education on employment probably declines with time.

The results of most present interest concern, however, the variables designed to capture the effects of the passage of ADEA. Consider first the total employment case. In this case the coefficient on the dummy is significant and positive while the interactions coefficient is significant and negative. This suggests that the impact of the ADEA was at best mixed for the 45 to 65 year age group. While this group did enjoy an initial improvement in their employment position relative to the younger workers, they found the rate at which they were losing ground to the younger workers to have increased after the enactment of the ADEA. Given this increased rate of decay in the employment ratio, older workers will eventually find themselves in a position relative to the young that is actually worse than would have been the case in the absence of the ADEA.

Considering the results for males, we find results that are a bit different. Specifically, the coefficients on the dummy and interaction terms are both insignificant indicating that, for males aged 45 to 65, the passage of the ADEA was unrelated to their employment success or failure relative to younger male workers. Finally, for females the coefficient on the dummy term is positive and the coefficient on the interaction is negative and significant indicating that the ADEA had effects for females that were of the same direction as those which were found for the total category.

The employment effects of the unamended ADEA on the 45 to 65 age group are thus less than encouraging. While there may have been an initial improvement in their employment positions relative to younger workers, they have experienced more rapid relative declines since the passage of the ADEA than before.

Next, consider the results concerning the employment impact of the 1978 amendment to the ADEA. Here we are considering the employment rates of individuals aged 66 to 69, relative to the younger cohort. The regression

Table 1

Older (45-65) / Younger Employment Rate Ratios, 1961-1981

Independent Variables	Dependent Variables			
	Total Old	Old Male	Old Female	
		Young Male	Young female	
Intercept	0.174 (0.719)	0.893 (10.806)*	0.495 (0.440)	
Education (ED)	-0.122 (-0.337)	0.029 (0.266)	-0.402 (-0.320)	
Relative Supply (SUP)	0.934 (5.502)*	0.042 (0.344)	1.005 (3.651)*	
Percentage Change in GNP (PCNP)	-0.001 (-1.650)*	-0.001 (-1.992)*	-0.002 (-0.831)	
Dummy (D)	0.019 (2.071)*	0.013 (0.490)	0.151 (1.234)	
Time (t)	-0.001 (-0.102)	-0.003 (-1.774)*	-0.001 (-0.133)	
Interaction (D*t)	-0.009 (-2.442)*	-0.001 (-0.257)	-0.019 (-1.711)*	
	R ² = .996 F = 456.322	R ² = .966 F = 49.213	R ² = .989 F = 159.603	

() : t values in parenthesis

* : Significant at .1 level

results, where the Cochran-Orcutt technique was again used, are reported in Table 2.

Again, the model appears to fit rather well. Several results are similar to those reported for the 45 to 65 age group. For example, in the total and female cases the relative years of education appears to be unassociated to employment (this is not the case for males, however). There are some interesting differences, however. With the older age group, the percentage change in GNP is insignificant except for the male case suggesting that, overall, this group may hold jobs that are roughly equal to those held by younger male workers with regard to cyclical sensitivity. A result of further interest concerns the relative supply variable. Overall, and for females, the coefficient is positive and significant suggesting that as the proportion of this group increases relative to the younger group, their relative employment improves. Just the opposite result is found for the male category as expected. Finally, the SS variable also behaves as expected. The negative and significant coefficient on this variable for each case indicates that, the average monthly Social Security payment and the relative employment rate of older workers are negatively related.

Turning to the results concerning the employment effects of the amended ADEA we find that for the total population of workers aged 66-69 the initial impact of the legislation was negative (negative dummy), but the legislation did reverse the decay in relative employment rates. This indicates that, while the ratio of older to younger employment was lower after the ADEA amendment, eventually, given the reversal of the downward trend, older workers will find an improvement in their relative employment position over what would have prevailed in the absence of the amendment. Given this, it appears that the amendment to the ADEA has been, at least, a partial success with regard to the relative employment of those aged 66 to 69. These results are echoed in the findings regarding the female subset of this age group, a negative initial effect is uncovered followed by a reversal of the downward trend. Interestingly enough, however, as was the case above, the relative employment of males does not appear to be significantly associated with the amendment to the ADEA. In each case the estimated total effect appears to be dominated by the effects of the legislation on females.

Conclusions

Age discrimination in employment has been long recognized in the American economy. With the passage of the Age Discrimination in Employment Act of 1967 and its amendment in 1978, public policy moved to correct the inequities caused by such discrimination. The purpose of this paper has been to consider the effectiveness of the legislation by determining the impact of the legislation on the relative employment of older workers. Breaking the impact down into its legislative parts, the impact of ADEA on those 45 to 65 and the impact of the 1978 amendment on those 66 to 69, it was found that, in general, the legislation has been less than completely successful. Those aged 45 to 65 did enjoy an initial improvement in their employment relative to younger workers, however, this new higher level of labor market success was subject to a rate of decay even greater than that which these workers had experienced prior to the legislation. Consequently, eventually workers between the ages of 45 and 65 will find themselves worse off relative to younger workers than they would have been in the absence of the legislation.

The situation was slightly better for those workers aged 66 to 69. For this group, the amendment to the legislation, while followed by an initial

Table 2

Older (66-69) / Younger Employment Rate Ratios, 1961-1981

Independent Variables	Dependent Variables			
	Total Old	Old Male	Old Female	
	Total Young	Young Male	Young female	
Intercept	0.063 (1.25)	0.666 (13.47)*	-0.019 (-0.40)	
Education (Ed)	-0.011 (-0.26)	-0.147 (-2.59)*	0.038 (1.14)	
Relative Supply (SRP)	0.148 (1.65)*	-0.678 (-9.23)*	0.269 (2.31)*	
Percentage Change in GNP (PGNP)	0.001 (1.15)	-0.111 (-2.11)*	0.001 (0.89)	
Pensions (SS)	-0.001 (-3.64)*	-0.001 (-1.95)*	-0.001 (-2.63)*	
Dummy (D)	-0.126 (-2.94)*	-0.104 (-1.05)	-0.132 (-4.21)*	
Time (t)	-0.001 (-0.42)	-0.001 (-1.24)	-0.002 (-1.86)*	
Interaction (D* _t)	0.007 (2.98)*	0.005 (1.12)	0.007 (4.47)*	
	R ² = .979 F = 87.316	R ² = .978 F = 82.69	R ² = .985 F = 89.175	

() : t values in parenthesis

* : Significant at .1 level

decline in their relative employment position, reversed the rate of the decay in their relative position. Consequently, beyond some point in time, these workers will be significantly better off than they would have been in the absence of the legislation.

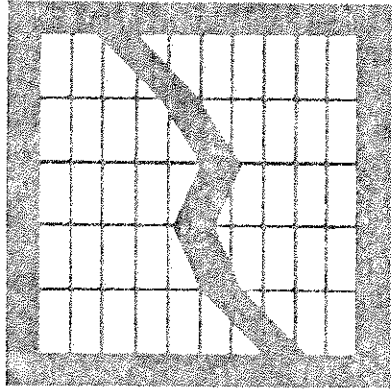
Given results of this nature, it appears reasonable to conclude that, if one is committed to reversing the effects of age discrimination in employment in a timely fashion, tools that strengthen the ADEA and its amendment must be found.

NOTES ON DATA

The employment rate variables, the population supply variables, and the percentage change in real GNP variable are constructed from data taken from U.S. Department of Commerce, Bureau of the Census, Statistical Abstract of the United States, various issues. The education variables are constructed from data available in U.S. Department of Commerce, Bureau of the Census, Current Population Reports, Series P-20, various issues, and U.S. Department of Labor, Bureau of Labor Statistics, *MANPOWER REPORT TO THE PRESIDENT*, various issues. The Social Security benefit variable is constructed from data taken from the Social Security Administration's *Social Security Bulletin*, various issues.

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